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economic development has been toward closer relations with Great Britain and away from the United States. Now if reciprocity is wanted it has to be paid for at a higher price. Great Britain is bending her efforts to aid Canada in her ambition for economic independence of the United States.

One of the ominous signs of the times is the increasing dependence upon navies as a factor in commercial competition. "There can be no question that naval expansion is the dominant note in world policy to-day." Here we are brought face to face with the purpose for which this book was written, namely, to rouse America to the realization that her scope of development as a commercial power in the Pacific depends on her attitude toward the Russian policy of territorial expansion over Chinese territory. Russia's ambitions "may be briefly summed up as being chiefly inimical to the United States in that they are essentially monopolistic. * * * Russia with her program of territorial expansion, military achievements, closed ports, autocratic government and non-progressiveness is a menace to the world" (p. 358).

The assured sovereignty of China seems to be the only basis of permanency to far eastern peace and prosperity (p. 381). The breaking up of China would jeopardize Japan's position, because it would mean an ascendancy of Russia and her sympathizers, Germany and France. In our author's view Russia's advance long since passed the defensible limit where British and American interests are impaired. These two interests he groups under the term Anglo-Saxon, and asks:

What course can be suggested which would best serve the interests of Anglo-Saxondom? * * * Were her expansion the legitimate expression of internal growth and progress, as has been that of the United States, it would be unreasonable to adopt a hostile attitude towards it. Even from the point of view of ethics the territory hitherto conquered or annexed by Russia is probably better off under her than under half savage khans. But Russia's expansion is no longer legitimate. She has reached her objective, the Pacific Ocean, and has not paused to develop or organize the vast territories she has occupied; she has in no case laid the foundation of a future of freedom and

prosperity for the conquered peoples. She has already imposed a cast-iron system and planted military colonies to keep things in order. She has no excuse save her own insatiable ambition and land hunger.

JOHN FRANKLIN CROWELL.

WASHINGTON, D. C.

SCIENTIFIC JOURNALS AND ARTICLES.

IN the November number of the *Botanical Gazette* Edward C. Jeffrey describes a new fossil sequoia from the Auriferous Gravels (Miocene) of the Sierra Nevada Mountains. He emphasizes his previously expressed view that the sequoias have originated from the Abietinæ.—George H. Shull publishes the results of his second season's study of the place-constants for *Aster prenanthoides* at Clifton, Ohio. This second collection was made in 1903 from the same area that supplied material for a quantitative study in 1900. The bracts, rays and disk-florets were studied quantitatively and the results compared with those of the earlier study.—B. L. Robinson describes 'A New Sheep Poison from Mexico,' which proves to be a new species of *Bouchetia*.—Elias Nelson publishes three western species of *Agropyron*.—Conway MacMillan describes some very interesting British Columbian dwarf trees. They grow on the rocks close to the sea but outside the influence of the surf, and represent three species: *Picea sitchensis*, *Tsuga heterophylla* and *Thuja gigantea*. One of them was less than two feet high and was 68 years old; another less than a foot high was 86 years old; and the third about a foot high, with a trunk one inch in diameter, was 98 years old.—A. C. Life describes some interesting results from an injury to *Ambrosia*, the chief result being that the primordia usually producing stamens and ovules produced vegetative shoots.

WE learn from *The British Medical Journal* that arrangements have been made with the Syndics of the Cambridge University Press to begin the issue of a *Journal of Agricultural Science*, under the editorship of Messrs. T. H. Middleton, T. B. Wood, R. H. Biffen, and A. D. Hall, in consultation with other gentlemen. The journal will publish only definitely scien-

tific work in agricultural science, and will not include the results of the ordinary trial of manures and varieties for demonstration or commercial purpose. It is proposed to issue the journal as material accumulates, aiming at quarterly parts of about 100 royal 8vo pages, four parts to constitute a volume. Among those who have promised to support the journal are: Professor H. E. Armstrong, F.R.S., Professor M. J. R. Dunstan, Dr. Bernard Dyer, Professor Liveing, Mr. A. E. Shipley, Dr. J. Augustus Voelcker, and Professor Marshall Ward. The first number will be published in January, 1905.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 589th regular meeting was held October 29.

Father Hagen, of the Georgetown Observatory, gave an account of 'Astronomy and Mathematics at the International Congress of Arts and Science,' speaking of the papers read, the persons present, the exhibits in various parts of the grounds and the formal and informal gatherings. Two great European congresses held just previous to that at St. Louis kept away many of the expected visitors.

Mr. C. E. Van Orstrand, of the Geological Survey, then presented a paper on 'A Load-Strain Function for Finite Strains.' The results of numerous experiments were summarized as showing that the load-strain curve is in general convex to the axis of loads, although in some instances there is one point of inflexion. Since matter is indestructible, the ordinates of the curve between the points of rupture for tension (x_t) and compression (x_c) are necessarily finite and positive. Hence the load-strain function can contain no zeros and no negative values between the limits x_c and x_t . There is a point of discontinuity at x_t , and for certain substances there may also be a point of discontinuity at x_c . Functions satisfying these conditions were defined by means of the function-theory. A special form of the most general equation is

$$y = (be^{c(x_t-x)^n} + k) - p,$$

where y = strained length and x = applied load.

For the case of perfect elasticity, $x_t = +\infty$, and a particular form of the equation is

$$y = e^{cx},$$

a relation which has previously been deduced, but by a wholly different method.* It was shown that this equation represents the data of observation to a high degree of accuracy within the limits ordinarily defined as perfectly elastic. The materials selected were vulcanized India rubber† and various kinds of metallic wires.‡

A letter from Dr. Becker was read expressing his appreciation of Mr. Van Orstrand's investigation.

Mr. C. W. Waidner, of the Bureau of Standards, gave the results of numerous determinations by himself and Mr. G. K. Burgess, of 'The Temperature of the Electric Arc.' A photometric method was used based on Wien's law and the instruments were calibrated at higher temperatures than had been done heretofore, so the uncertainty from extrapolation was reduced; the results were very accordant and gave about 3700° C. An increase of 70° to 80° was found when the current forming the arc was raised from 15 to 30 amperes.

CHARLES K. WEAD.

THE GEOLOGICAL SOCIETY OF WASHINGTON.

THE 158th meeting of the Society on November 9 had the following regular program:

Mr. S. F. Emmons spoke of copper ores in Carboniferous limestone in the region of the Grand Canyon of the Colorado, some of which he had an opportunity of visiting during the past summer. Their origin had been ascribed to the leaching of the copper from the red sandstones which once overlay them but are now eroded away. He used these occurrences as a text to discuss the general question as to whether the widespread occurrences of copper in the Permian and

* 'The Finite Elastic Stress-Strain Function,' Dr. George F. Becker, *Am. Jour. Sci.*, 1893.

† Watertown, 'Tests of Metals,' 1893.

‡ 'Ueber das Gesetz der elastischen Dehnung,' J. O. Thomson, *Ann. d. Phys.*, 3, 1891.